Complete Summary

GUIDELINE TITLE

Life after stroke. New Zealand guideline for management of stroke.

BIBLIOGRAPHIC SOURCE(S)

New Zealand Guidelines Group (NZGG). Life after stroke. New Zealand guideline for management of stroke. Wellington (NZ): New Zealand Guidelines Group (NZGG); 2003 Nov. 84 p. [164 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Stroke including:

- Ischaemic stroke
- Transient ischaemic attack
- Intracerebral haemorrhage

Note: Subarachnoid haemorrhage is not addressed in the guideline.

GUIDELINE CATEGORY

Diagnosis
Management
Treatment

CLINICAL SPECIALTY

Family Practice
Internal Medicine
Neurology
Physical Medicine and Rehabilitation

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Health Care Providers
Health Plans
Hospitals
Managed Care Organizations
Nurses
Patients
Physician Assistants
Physicians
Public Health Departments

GUIDELINE OBJECTIVE(S)

- To facilitate better and more equitable outcomes for people with a stroke in New Zealand and their families/whanau by presenting the evidence currently available for the most effective management of specific problems after stroke
- To add to an existing knowledge base for evidence-based, cost-effective, and equitable management of stroke
- To provide a commentary on the most effective way to manage stroke in the New Zealand setting, including approaches to cultural issues
- To assist people with a stroke and their families/whanau to make informed decisions
- To highlight the need for significant changes in current practice in New Zealand
- To ensure access to resources for stroke management

TARGET POPULATION

Adult patients in New Zealand who have had a stroke and their care providers

Note: This guideline does not cover stroke in infants, children, and youth.

INTERVENTIONS AND PRACTICES CONSIDERED

Note: This guideline does not cover primary prevention of stroke.

Diagnosis

1. Imaging of the brain
    - Computed tomography
    - Magnetic resonance imaging
    - Other studies as indicated (e.g., ultrasound)
2. Blood glucose electrocardiogram
3. Chest x-rays (considered but not recommended)

4. Assays:
    - Full blood count (including platelet count)
    - Erythrocyte sedimentation rate
    - Serum urea
    - Creatinine
    - Electrolytes
5. Coagulation studies:
    - Bleeding time
    - Prothrombin times
    - Activated thromboplastin times

Treatment/Management

1. Organized stroke services
    - Multidisciplinary team
    - Use of written protocols
    - Services responsive to needs of very young, very old, and specific groups such as Maori and Pacific peoples.
2. Initial assessments
    - Use of validated, reliable instruments
    - Swallowing assessment
    - Assessment for vascular risk factors
    - Rehabilitation assessment
3. Nutrition
    - Nutrition support
    - Diet modification
    - Feeding posture and equipment
4. Endovascular treatment (considered but not specifically recommended)
5. Osmotherapy and hyperventilation for selected patients
6. Drainage of cerebrospinal fluid
7. Surgical decompression
8. Carotid endarterectomy
9. Compression stockings
10. Early mobilization
11. Supplemental oxygen
12. Carotid angioplasty and stenting
13. Angiography for selected patients
14. Surgical removal of haematoma
15. Rehabilitation services and follow up
    - Early supported discharge
    - Patient and care giver education
16. Drug treatments considered:
    - Oral hypoglycaemics
    - Anticonvulsants
    - Insulin
    - Aspirin
    - Tissue plasminogen activator (tPA)
    - Intravenous streptokinase or ancrod
    - Heparin
    - Corticosteroids
    - Antihypertensive agents
    - Statins

- Clopidogrel
- Dipyridamole
- Warfarin

17. Alternative therapies

MAJOR OUTCOMES CONSIDERED

- Effectiveness of medication
- Return to previous level of function (e.g., activities of daily living, leisure activities, ability to drive)
- Patient satisfaction/quality of life

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Overview

This guideline is an adaptation of the American Heart Association (AHA) (Stroke Council), the American Stroke Association (ASA), the Royal College of Physicians (RCP) and the Scottish Intercollegiate Guidelines Network (SIGN) stroke guidelines, with the evidence updated and expanded where thought appropriate.

Search Strategy

A comprehensive search of the published literature on stroke management and rehabilitation was undertaken by New Zealand Health Technology Assessment (NZHTA) Clearing House, using as a basis search strategies provided by SIGN. The scope of the search included existing guidelines and systematic reviews gathered from review databases, bibliographic databases, and selected major Web site resources according to the NZHTA protocol. A final search was undertaken in April 2003 to include any new and relevant publications to that date.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Evidence is graded according to the Scottish Intercollegiate Guidelines Network (SIGN) system.

Levels of Evidence

1++

High-quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias

1+

Well conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias

1-

Meta-analyses, systematic reviews, or RCTs with a high risk of bias

2++

High-quality systematic reviews of case-control or cohort studies

High-quality case-control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal

2+

Well conducted case-control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal

2-

Case-control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal

3

Non-analytic studies (e.g. case reports, case series)

4

Expert opinion

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The guideline development team was divided into subgroups and carried out work on designated areas: epidemiology and costs of stroke, organisation and evaluation of stroke services in New Zealand, acute management, rehabilitation, and longer-term issues. Maori, Pacific, and general practice representatives advised on appropriate content throughout. Drafts were commented upon by the entire team and redrafted by the project editor. Agreement was by consensus; if agreement could not be reached, the co-editors were authorised to make a final recommendation, and any such instances are indicated in the guideline.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

The guideline uses the following New Zealand Guidelines Group grading:

A

The recommendation is supported by good evidence.

B

The recommendation is supported by fair evidence.

C

The recommendation is supported by expert opinion only and/or limited evidence.

I

No recommendation can be made because the evidence is insufficient. Evidence is lacking, of poor quality or conflicting, and the balance of benefits and harms cannot be determined.

GPP

Recommended good practice based on the clinical experience of the guideline development group and where guidance is needed

COST ANALYSIS

Published cost analyses were reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

People who had experienced stroke services in the previous 12-18 months and who might wish to participate were given the option of reviewing a draft of the guideline. A selection of their comments is included in the guideline.

In addition, the draft guideline document was sent to 207 organisations and individuals for appraisal using the Appraisal of Guidelines for Research and Evaluation (AGREE) instrument. Comments were considered by the guideline development team and the New Zealand Guidelines Group and adjustments incorporated.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Definitions for the Levels of Evidence (1++ to 4) and Grades of Recommendation (A - C, I, and Good Practice Points [GPP]) are given at the end of the "Major Recommendations" field.

Organisation and Evaluation of Stroke Services in New Zealand

Organized Stroke Services

A All District Health Boards must provide organised stroke services.

GPP All people with stroke should have the same degree of access to appropriate stroke services irrespective of where they live, their age, gender, or ethnicity.

Stroke Unit Care

A All people admitted to hospital with stroke should expect to be managed in an area of the hospital designated for people with stroke (i.e. a stroke unit) (Royal College of Physicians, 2002).

A The use of a specialised stroke unit, incorporating comprehensive rehabilitation, is recommended (Adams et al., 2003).

Inpatient Organisation for Different-sized District Health Boards

Large District Health Boards

GPP All people with stroke should be admitted under the care of a designated stroke clinician, in a separate stroke unit or a designated area within a general unit.

GPP The ongoing rehabilitation of all people with stroke should occur in a geographically designated area (i.e. a stroke unit) under the care of a coordinated multidisciplinary team involving stroke specialist clinicians.

GPP If at all possible, the acute AND rehabilitation management should be in the same area (i.e. an integrated acute and rehabilitation stroke unit).

GPP The multidisciplinary team should use written protocols for the management of common problems following stroke and have an ongoing programme of education about stroke for staff, people with stroke, and families.

Medium-sized District Health Boards

GPP All people with stroke should be admitted to a defined area for acute management, in a separate area or a designated area within a general unit. The acute care of all people with stroke should occur in consultation with the hospital's designated stroke clinician(s).

GPP The ongoing rehabilitation of all people with stroke should occur in a geographically designated area (i.e. a stroke unit) under the care of a coordinated multidisciplinary team involving stroke specialist clinicians. It is possible that people with stroke will not be the only patients managed by this team.

GPP The multidisciplinary team should use written protocols for the management of common problems following stroke and have a programme of regular education about stroke for staff, people with stroke, and families.

Small District Health Boards

GPP The acute care of all people with stroke should occur in consultation with the hospital´s designated stroke clinician(s).

GPP The ongoing rehabilitation of all people with stroke should occur under the care of a coordinated multidisciplinary team involving people knowledgeable and enthusiastic about stroke. People with stroke will not be the only patients managed by this team.

GPP The multidisciplinary team should use written protocols for the management of common problems following stroke and have a programme of regular education about stroke for staff, people with stroke, and families.

Scope of Community Services (Diagnostic, Secondary Prevention, and Rehabilitation)

B All District Health Boards should provide a full range of community services to complement inpatient stroke services (Royal College of Physicians, 2002).

Organisation of Community Rehabilitation Services

General Principles

C All people with stroke who are managed at home or discharged from hospital with residual disability should be managed by a team of health professionals knowledgeable in stroke.

A Community rehabilitation can be provided with equal effectiveness from a day hospital or community (i.e. home-based) setting (Royal College of Physicians, 2002).

C There must be a high level of coordination between inpatient and community stroke services within each District Health Board, aiming for seamless management of the person with stroke wherever they are managed.

Specific recommendations for different-sized areas:

Large District Health Boards

GPP A specialist multidisciplinary rehabilitation community team with expertise in the management of stroke should manage all people discharged from hospital following acute stroke and any people with stroke managed at home without hospital admission. Some team members may be "stroke dedicated" (e.g., nurse), while others may have an additional non-stroke caseload (e.g., physician, speech and language therapist).

Medium- and Small-sized District Health Boards

GPP Rehabilitation should be managed as described above for large District Health Boards, but it is likely that most team members will also have a non-stroke caseload.

Rural Communities

GPP The lead stroke clinician should have input on a regular basis to ensure advice and support to all facilities and services involved in stroke care. Local solutions to issues of coordination of community services may be required. These may include inpatient staff having a role in the community and relationships with private providers and general practitioners. The solutions should focus on maintaining and enhancing stroke expertise among available staff to provide the best possible service to people with stroke.

Special Considerations for the Very Old and Very Young

GPP For some very old or already very frail people, issues relating to a stroke may be of less importance than those of accumulated comorbidities so that management in an environment appropriate for these needs (such as a specialised geriatric service) may be preferable to a stroke unit. This will be a clinical decision.

C Younger people with stroke should be managed primarily in a stroke unit rather than in an age-restricted unit with patients with other disabilities (such as head injury).

Services Responsive to Maori

Whanau

GPP For Maori with stroke, whanau wellbeing is the desired outcome. Whanau must be involved in all aspects of stroke management including education, rehabilitation, and discharge planning.

Communication

GPP Communication between Maori with stroke, their whanau, and health professionals must be appropriate. Information developed by Maori that is specific to the needs of Maori and their whanau is the ideal.

Service Providers

GPP Responsiveness of mainstream providers to Maori with stroke and their whanau will be improved when:

- people with stroke and their whanau are informed and supported in an appropriate manner (examples include access to a Maori liaison service, increased support to sustain lifestyle changes and to access outpatient services, and whanau involvement in making decisions, including setting goals)
- local Maori providers are consulted regularly
- barriers to stroke care, including transport and socioeconomic factors, are addressed

Services Responsive to Pacific Peoples

GPP To improve outcomes for Pacific people with stroke it is necessary to:

- recognise the national and cultural diversity within the Pacific community and "tailor" healthcare for the individual
- appreciate the holistic view of health held by Pacific peoples
- involve caregivers, family members, and other members of the community in the management of stroke
- consider the implications of difficult socioeconomic circumstances, especially for compliance
- acknowledge and be open to the use of traditional healing methods
- develop and support Pacific health providers and establish partnerships between these and mainstream health services to ensure streamlined care plans

General Practitioner Care

GPP The general practitioner should take primary responsibility for:

- recognition of stroke syndrome and urgent referral for assessment in hospital or at an outpatient clinic (see pages 6-7 in the original guideline document)
- management of primary prevention of cerebrovascular disease
- management of secondary prevention of cerebrovascular disease

- awareness of resources for people with stroke (e.g., appropriate outpatient clinic, local Stroke Foundation services, educational literature), and how to refer

Stroke Workforce

GPP At both national and District Health Board levels, measures should be taken to increase the numbers and enhance the training of the stroke workforce.

Evaluation of Stroke Services to Improve Performance over Time

Indicators for Stroke Services

GPP The key indicators for stroke services should be:

- Compliance with the recommendations in this section for organised stroke services at a level that matches the volume of people with stroke in the region (Yes/no item)
- Compliance with the recommendation for a named lead clinician responsible for stroke services within the District Health Board (Yes/no item)
- Proportion of all people with stroke admitted to a stroke unit (%) (Target = 95%)
- Proportion of hospital stay spent in a stroke unit (%) (Target = >50%)
- Compliance with the recommendation for written protocols for problems as outlined in the following section (Yes/no item)
- Breakdown by age, gender, ethnicity of all people admitted to hospital with stroke and those who spent any time in the stroke unit (i.e., equity of access, %)

Assessment and Management of Stroke

Assessments

GPP People with stroke should have the initial assessment completed with minimal delay.

GPP The assessments listed below should be undertaken for every person with stroke. Clinicians should, where possible, use validated, reliable instruments.

Early Assessments (The First 48 Hours)

Initial assessments should include the following parameters:

- Level of consciousness (C)
- Swallowing (B)
- Nutrition (B)
- Continence (B)
- Risk factors (see pp. 42 in the original guideline document)
- Hydration (GPP)
- Self-care (GPP)
- Communication (B)

- Appropriate moving and handling of the person with stroke, matched to the level of impairment (C)
- Risk for falling (GPP)
- Risk for developing pressure areas (C)
- Risk for deep vein thrombosis/pulmonary embolism (A)

Assessments Prior to Discharge

To assist rehabilitation planning, information on the following should be obtained as early as possible during the hospital stay:

- Suitability of likely discharge accommodation
- Available supports on discharge
- Mood
- Cognitive status
- Major interests of person with stroke
- Long-term goals
- Work/study/leisure situation
- Cultural/spiritual issues
- Adequacy of information for person and support people
- Driving ability, adequacy of information on driving status on discharge.

Swallowing

B Swallowing should be assessed in all people with stroke as soon as possible (and preferably on admission) by appropriately trained personnel using a simple, validated testing protocol (Royal College of Physicians, 2002).

A Any person with an abnormal swallow should be seen by a speech and language therapist, who should assess the person further and advise the person and staff on safe swallowing techniques and strategies and the consistency of diet and fluids (Royal College of Physicians, 2002).

Written Protocols for Management of Common Problems

C Written protocols should be available for the management of problems that may lead to adverse outcomes, problems that cross professional boundaries, or where consistency of care may be an issue because of changing staff.

Admission to Hospital

GPP All people with a definite or presumptive diagnosis of stroke should be admitted to hospital unless:

- their symptoms have fully resolved or are rapidly recovering so that there is minimal interference with activities of daily living AND urgent outpatient assessment by a specialist stroke service is available OR
- in the opinion of the treating doctor AND the person, or the person´s family, there is unlikely to be any benefit from admission to hospital. This may apply to people who were already severely disabled or suffering a terminal illness prior to the stroke.

Speed of Admission to Hospital

GPP All people with a definite or presumptive diagnosis of stroke should be transferred to hospital urgently.

C Where the local hospital offers acute thrombolytic treatment for ischaemic stroke, and time of stroke onset is known, people with stroke should expect to be admitted to hospital and have initial assessments (including computed tomography [CT]) completed within 3 hours of stroke onset.

Diagnosis of Stroke

B The diagnosis of stroke should always be reviewed by a physician with special expertise in stroke (Royal College of Physicians, 2002).

A Imaging of the brain is required to guide acute intervention (Adams et al., 2003).

C Imaging of the brain should be performed as soon as possible and not more than 48 hours after the onset of symptoms, unless there is a good clinical reason for not doing so (Royal College of Physicians, 2002).

B Brain imaging should be undertaken urgently if:

- there is a deterioration in the person's condition following the onset of symptoms
- subarachnoid haemorrhage is suspected
- hydrocephalus secondary to intracerebral haemorrhage is suspected
- trauma is suspected
- the person is on anticoagulant therapy or has a known bleeding tendency
- the diagnosis is in doubt
- thrombolytic therapy is being considered (Royal College of Physicians, 2002)

C Brain imaging should always be undertaken before anticoagulant therapy or thrombolytic therapy is started.

C All people with a definite or presumptive diagnosis of stroke should have the following investigations:

- full blood count (including platelet count)
- erythrocyte sedimentation rate
- serum urea, creatinine, electrolytes
- blood glucose
- electrocardiogram (SIGN, 2002).

B Chest x-rays should not be undertaken as a routine investigation unless specifically indicated by the patient's symptoms or signs (Adams et al., 2003; Royal College of Physicians, 2002).

Nutrition

A Nutritional support should be considered in any malnourished patient (Royal College of Physicians, 2002).

C Every person with nutritional problems, including dysphagia, who requires food of modified consistency should be referred to a dietitian (Royal College of Physicians, 2002).

C The most suitable posture and equipment to facilitate feeding should be determined (Royal College of Physicians, 2002).

Ischaemic stroke

Acute interventions

Aspirin

A Aspirin 160 to 300 mg should be given as soon as possible after the onset of a stroke in most patients if a diagnosis of intracerebral haemorrhage has been excluded with brain imaging (Adams et al., 2003; Royal College of Physicians, 2002).

A Administration of aspirin within 24 hours of the use of a thrombolytic agent is not recommended (Adams et al., 2003).

Thromobolysis

A Thrombolytic treatment should be administered only in specialist centres by physicians with expertise in the assessment and management of people with acute stroke and where protocols for the use of thrombolysis are in place (Royal College of Physicians, 2002).

Intravenous Thrombolysis

A Thrombolytic treatment with intravenous tissue plasminogen activator (tPA) 0.9 mg/kg (maximum dose 90 mg) may be given to carefully selected people with acute ischaemic stroke if:

- there is a clear history of the time of onset of symptoms
- treatment is given within 3 hours of the onset of symptoms
- intracerebral haemorrhage has been excluded by imaging (Adams et al., 2003; Wardlaw, del Zoppo, & Yamaguchi, 2001)

A The use of intravenous streptokinase or ancrod as an alternative to tPA is not recommended (Adams et al., 2003).

Intra-arterial Thrombolysis

C Carefully selected patients presenting within 0 to 6 hours after the onset of symptoms who have angiographic evidence of a middle cerebral artery occlusion may be treated with intra-arterial thrombolysis. Immediate access to cerebral angiography and expertise with intra-arterial thrombolysis are required.

Heparin

A Intravenous heparin, subcutaneous heparin, low-molecular-weight heparin, and heparinoids are not routinely recommended for the treatment of people with acute ischaemic stroke (Adams et al., 2003; Royal College of Physicians, 2002).

Carotid Endarterectomy

C Carotid endarterectomy is not recommended for people with acute ischaemic stroke (Adams et al., 2003).

Endovascular Treatment

C The use of endovascular treatments, such as angioplasty or stenting, is not recommended for treatment of people with acute ischaemic stroke (Adams et al., 2003).

Other Treatments

A No agents with putative neuroprotective effect can be recommended for the treatment of acute ischaemic stroke (Adams et al., 2003).

B Other treatments, including corticosteroids, calcium antagonists, glycerol, volume expansion, vasodilators, and induced hypertension should not be used unless as part of a randomised controlled trial (Royal College of Physicians, 2002).

B Drugs with a sedative effect should be avoided if possible (Royal College of Physicians, 2002).

Neurological Complications

Brain Oedema and Increased Intracranial Pressure

Corticosteroids

A Corticosteroids are not recommended for the management of cerebral oedema and increased intracranial pressure following an ischaemic stroke (Adams et al., 2003).

Osmotherapy

B Osmotherapy (e.g., intravenous frusemide and intravenous mannitol) and hyperventilation are recommended for selected patients who are deteriorating secondary to increased intracranial pressure (Adams et al., 2003).

Drainage of Cerebrospinal Fluid

C Drainage of cerebrospinal fluid via a ventricular drain or shunt may be used to treat raised intracranial pressure secondary to hydrocephalus (Adams et al., 2003).

Surgical Decompression of Large Cerebellar Infarcts

C Surgical decompression and evacuation of large cerebellar infarcts that are leading to compression of the brainstem and hydrocephalus is recommended (Adams et al., 2003).

Surgical Decompression of Large Cerebellar Hemisphere Infarcts

C Surgical decompression of a large infarct of the cerebral hemisphere which is associated with cerebral oedema and increased intracranial pressure is not routinely recommended. It can be a life-saving measure, but most survivors have severe residual neurological impairment (Adams et al., 2003).

Seizures

C Anticonvulsants after stroke are not recommended unless the person has had at least one seizure. If a person has had a seizure, treatment with an anticonvulsant to prevent recurrent seizures is strongly recommended (Adams et al., 2003).

Medical Complications

Blood Pressure

C A cautious approach should be taken toward the treatment of arterial hypertension in the acute stage (Adams et al., 2003).

C Antihypertensive agents should be avoided unless the systolic blood pressure is >220 mm Hg or the diastolic blood pressure is >120 mm Hg (Adams et al., 2003).

C Patients with elevated blood pressure who are otherwise eligible for treatment with intravenous tPA can have their blood pressure lowered cautiously so that their systolic blood pressure is $\leq$185 mm Hg and the diastolic blood pressure is $\leq$110 mm Hg (Adams et al., 2003).

C In the exceptional circumstances where blood pressure lowering is required, agents such as labetalol that have a short duration of action and minimal effect on cerebral blood vessels are preferred in the acute stage. Sublingual nifedipine should be avoided (Adams et al., 2003).

Blood Glucose

C Until there are more data to guide treatment, management of hyperglycaemia should be similar to that for other persons with an elevated blood glucose (Adams et al., 2003).

Pyrexia

B Fever should be controlled with the use of antipyretics, such as paracetamol, and treatment of the underlying cause (Adams et al., 2003).

Venous Thromboembolism

Aspirin

A Aspirin 160 to 300 mg/day should be given for the prevention of venous thromboembolism in the absence of any contraindication (Royal College of Physicians, 2002).

Compression Stockings

C Compression stockings should be considered in people with stroke who have weak or paralysed legs once the person´s peripheral circulation, sensation, and the state of the skin have been assessed.

Mobilisation

B Mobilisation should be encouraged as early as possible after the onset of the stroke (Adams et al., 2003).

Prophylactic Anticoagulants

C It is the consensus of the New Zealand stroke guideline development team that prophylactic anticoagulation should not be routinely administered as deep vein thrombosis prophylaxis after stroke. Prophylactic anticoagulation may be considered in immobilised people with stroke who are intolerant of aspirin, are unable to wear compression stockings, or have had a previous venous thrombosis.

Hypoxia

C Supplemental oxygen should be given to hypoxic patients, aiming to maintain oxygen saturation at $\geq$95% (Adams et al., 2003).

C Non-hypoxic patients should not be given supplemental oxygen (Adams et al., 2003).

Transient Ischaemic Attacks (TIAs)

C Patients should be assessed as soon as possible after a TIA has occurred and no later than 7 to 14 days after an attack.

C Imaging with CT or magnetic resonance is recommended for patients after a hemispheric TIA, especially if TIAs are recurrent and stereotyped. Brain imaging is not routinely recommended after a vertebrobasilar TIA.

GPP Other investigations should be performed as recommended for patients who have had an ischaemic stroke. Depending on the clinical features, these tests may include ultrasound of the neck vessels, magnetic resonance angiography, transcranial Doppler imaging, digital subtraction angiography, echocardiography, and coagulation studies.

Intracerebral Haemorrhage

Investigations

Coagulation Studies

C A full blood count, bleeding time, prothrombin time, and activated partial thromboplastin time should be performed.

Angiography

C Angiography should be considered for patients with an intracerebral haemorrhage if:

- there is no clear cause for the haemorrhage
- the patient is a surgical candidate, especially a young, normotensive patient who is clinically stable (Broderick et al., 1999).

C Angiography is not required for older, hypertensive patients who have a haemorrhage in the basal ganglia, thalamus, cerebellum, or brainstem and in whom the CT or magnetic resonance imaging does not suggest that the haemorrhage was caused by an underlying vascular lesion (Broderick et al., 1999).

C Magnetic resonance angiography or CT angiography may obviate the need for cerebral angiography in selected patients (Broderick et al., 1999).

Surgical Removal of Intracerebral Haematomas

C Surgical removal of a haematoma may be considered for:

- patients with a cerebellar haemorrhage >3 cm in diameter who are deteriorating secondary to brainstem compression or hydrocephalus
- patients with an intracerebral haemorrhage associated with a structural lesion such as an aneurysm, arteriovenous malformation, or cavernous angioma, if the patient has a chance of a good outcome and the structural vascular lesion is surgically accessible (Broderick et al., 1999)

C Young patients with a moderate or large lobar haemorrhage who are clinically deteriorating may be candidates for surgical removal of a haematoma.

C Surgical removal of a haematoma should not be considered for:

- patients with a small supratentorial haemorrhage (<10 cm^3) or a minimal neurological deficit
- patients with Glasgow Coma Scale scores of $\leq$4, unless coma is secondary to cerebellar haemorrhage compressing the brainstem

Management of Raised Blood Pressure

C In patients who have an intracerebral haemorrhage, if there is a history of raised blood pressure mean arterial pressure (MAP) should be maintained below 130 mm Hg, where MAP = diastolic blood pressure + 1/3 (systolic blood pressure – diastolic blood pressure) (Broderick et al., 1999).

Secondary Prevention

B All people with stroke or transient ischaemic attack should be assessed for vascular risk factors and be treated appropriately (Royal College of Physicians, 2002).

Lifestyle Factors

C All people with stroke or transient ischaemic attack should be given appropriate advice on lifestyle factors such as not smoking, regular exercise, diet, achieving a satisfactory weight, reducing the use of added salt (Royal College of Physicians, 2002).

Cigarette Smoking

C Cigarette smoking should be discontinued.

Alcohol Consumption

C Excessive alcohol consumption should be discontinued. Mild to moderate use of alcohol (1 or 2 standard drinks per day) is associated with a reduction in stroke rates (Albers et al., 1999).

Physical Activity

A Moderate exercise (30–60 minutes of brisk walking, jogging, cycling, or other aerobic activity at least 3 times per week) is recommended (Albers et al., 1999; Wolf et al., 1999). Medically supervised exercise programmes are recommended for high-risk patients (e.g., those with cardiac diseases) (see http://www.nzgg.org.nz/index.cfm?fuseaction=fuseaction_10&fusesubaction=docs&documentid=22).

Bodyweight

B People who have a body mass index (BMI) >25 (especially those with BMI >30) should commence graduated lifestyle change aimed at weight reduction (Wolf et al., 1999).

Reduction in Blood Pressure

A Blood pressure-lowering treatment is recommended for all people after stroke or transient ischaemic attack unless the person has symptomatic hypotension.

Treatment of Diabetes Mellitus

GPP Diet, oral hypoglycaemics, and insulin should be prescribed as needed to control diabetes (Albers et al., 1999).

Lipid-modifying Treatment

B Treatment with a 3-hydroxy-3-methyl-glutaryl-coenzyme A (HMG-CoA) reductase inhibitor (statin) is recommended for most people following ischaemic stroke or transient ischaemic attack.

Aspirin

A Aspirin is recommended for secondary prevention for all patients after ischaemic stroke or transient ischaemic attack unless there is an indication for anticoagulation or a contraindication to aspirin (Antithrombotic Trialists' Collaboration, 2002).

C CT should be obtained prior to starting aspirin to exclude intracranial haemorrhage.

Clopidogrel

A Clopidogrel is recommended as a safe and effective antiplatelet treatment for the secondary prevention of stroke (CAPRIE Steering Committee, 1996).

Dipyridamole

I There is insufficient evidence to recommend dipyridamole as a first-line treatment for the secondary prevention of vascular events, either as monotherapy or in combination with aspirin.

B Combination treatment with modified-release dipyridamole and aspirin can be used for prevention of non-fatal stroke for patients at high risk of cerebral ischaemic events, including those who have symptomatic cerebral ischaemia while treated with aspirin alone.

B Monotherapy with modified-release dipyridamole is recommended for prevention of non-fatal stroke if aspirin is contraindicated and clopidogrel is unavailable.

Warfarin

A Anticoagulation should be started in every person with ischaemic stroke or transient ischaemic attack and atrial fibrillation (paroxysmal or sustained) unless contraindicated (Royal College of Physicians, 2002).

C Anticoagulation should be considered for all people who have had an ischaemic stroke associated with mitral valve disease, prosthetic heart valves, or myocardial infarction within the preceding 3 months (Royal College of Physicians, 2002).

A Anticoagulation should not be started until intracranial haemorrhage has been excluded by brain imaging (Royal College of Physicians, 2002).

A Anticoagulation should not be used routinely after transient ischaemic attacks or minor ischaemic strokes unless cardiac embolism is suspected (Royal College of Physicians, 2002).

B Anticoagulation following cerebral venous thrombosis appears to be safe and effective, even in the presence of intracerebral haemorrhage (de Bruijn & Stam, 1999; Fink & McAuley, 2001).

Carotid Endarterectomy

A Carotid endarterectomy is recommended for patients with symptomatic severe (70–99%) stenosis of the proximal internal carotid artery (Royal College of Physicians, 2002).

A Carotid endarterectomy should be performed only by specialist surgeons who can demonstrate a complication rate (stroke or death within 30 days) of $\leq$7% (Royal College of Physicians, 2002).

A Patients with symptomatic 50 to 69% stenosis of the internal carotid artery should be selected for carotid endarterectomy on a case-by-case basis. The absolute benefit of carotid endarterectomy for patients with a recent transient ischaemic attack or minor stroke and a moderate (50–69%) carotid stenosis is modest. Risk factors that increase the likelihood of benefit from surgery include male sex, increasing age up to 79 years, hemispheric rather than retinal symptoms, plaque surface irregularity, and coexistent intracranial atherosclerotic disease (Cina, Clase, & Haynes, 2002).

A Carotid endarterectomy is not recommended for patients with symptomatic proximal internal carotid artery stenosis less than 50% severity (Royal College of Physicians, 2002).

B Carotid endarterectomy may be considered without digital subtraction cerebral angiography for optimal surgical candidates when good-quality non-invasive imaging is available and a symptomatic high-grade (>70%) stenosis is confirmed both by Doppler ultrasound and by magnetic resonance angiography. Digital subtraction angiography is recommended prior to endarterectomy in all other circumstances, including patients with possible carotid artery occlusion (Barnett & Meldrum, 2000; Kent et al., 1995; Nederkoorn et al., 2002).

Carotid Endarterectomy for Asymptomatic Internal Carotid Artery Stenosis

A Routine carotid endarterectomy is not recommended for unselected patients with asymptomatic carotid stenosis (Chambers, You, & Donnan, 2002).

A Endarterectomy for asymptomatic stenosis must be performed by surgeons with exceptional skill who can demonstrate perioperative complication rates of $\leq$2% (Royal College of Physicians, 2002).

Carotid Angioplasty and Stenting

C Carotid angioplasty and stenting should be performed only by an experienced interventionist who can demonstrate a low periprocedural complication rate.

Extracranial-Intracranial Bypass Surgery

A Extracranial-intracranial bypass is not recommended for people with transient ischaemic attacks or minor strokes (Albers et al., 1999).

Early Supported Discharge

A Selected people with stroke can be considered for discharge home as soon as they are able to transfer independently from bed to chair, providing:

- there is a competent caregiver at home
- equivalent rehabilitation input coordinated by a multidisciplinary team can be delivered at home
- adequate support services are available in the community
- there are no environmental impediments (e.g., access to shower and toilet, wheelchair access to the house) (Early Supported Discharge Trialists, 2002).

Rehabilitation Management

When to Start Rehabilitation?

C All people with acute stroke, whether admitted to hospital or not, should have a rehabilitation assessment within the first 24 to 48 hours. The appropriateness and type of rehabilitation intervention will be determined by the results of this assessment.

Who Will Coordinate and Carry Out Rehabilitation?

GPP The rehabilitation team should comprise:

- health professionals with the combined skills to deal with the common issues following stroke and work in a coordinated way to achieve agreed goals
- the person with stroke and their caregivers/family/whanau

How Long Should Input from a Rehabilitation Team Continue and When Should It Stop?

GPP Continuous or intermittent input from a rehabilitation team may be appropriate over long periods of time following stroke, depending on the specific goals being addressed. Withdrawal of rehabilitation team management may occur appropriately when:

- the person with stroke wishes to exit from a formal rehabilitation programme
- no new achievable goals can be identified by the person with stroke and/or their caregivers

How Intense Must Rehabilitation Be?

GPP Local guidelines need to optimise the use of nursing and other trained staff to ensure that every person with stroke is involved in the maximum daily amount of goal-focused activity they can tolerate.

GPP All stroke inpatients should be involved in 7 days per week of goal-focused activity, whether or not this involves a therapist.

Should Community and Inpatient Rehabilitation Be Treated the Same?

GPP Every District Health Board should provide comprehensive rehabilitation services for people with stroke whether they are managed in an inpatient or community environment.

Community Rehabilitation Services

C Local stroke services must decide appropriate types, intensity, and duration of ongoing rehabilitation in the community. There should be appropriate processes to allow for reassessment of need for rehabilitation for all people with stroke.

Specific Rehabilitation Issues

Rehabilitation Interventions

GPP Any rehabilitation intervention needs to be considered within the context of an overall rehabilitation plan for the individual with stroke and the resources available.

Aphasia

B People with aphasia following stroke should be referred to a speech and language therapist for assessment and appropriate management of their communication difficulty (SIGN, 2002).

Care Pathways

A Routine implementation of care pathways for acute management and stroke rehabilitation is not recommended (Kwan & Sandercock, 2002).

Cultural Beliefs

GPP Cultural beliefs may affect rehabilitation of some people whose families may want to "look after" them, possibly rejecting other therapy. It is important that the need for and process of rehabilitation is fully explained in a suitable language/medium, and that culturally appropriate rehabilitation is offered.

Incontinence and Constipation

B Stroke units should have written assessment and management protocols for both urinary and faecal incontinence, and constipation (Royal College of Physicians, 2002).

C Active bowel and bladder management should occur from admission (Royal College of Physicians, 2002).

B Catheters should be used only after full assessment and as part of a catheter management plan using an agreed protocol (Royal College of Physicians, 2002).

C If incontinence persists after 3 weeks in spite of an active bowel and bladder management programme, further tests (urodynamics, anorectal physiology tests) should be considered (Royal College of Physicians, 2002).

C Incontinent inpatients should not be discharged until adequate arrangements for continence aids and services have been arranged at home and the carer has been adequately prepared (Royal College of Physicians, 2002).

C Continence services should cover both hospital and community, to provide continuity of care (Royal College of Physicians, 2002).

Mood Disorders

C People with stroke should be screened for depression and anxiety within the first month, and their psychological state kept under review. A standardized questionnaire (in those who can respond to it) may be used for screening but clinical diagnosis should be confirmed by clinical interview.

B Any person diagnosed with one form of mood disorder should be assessed for other psychiatric comorbidity.

C Mood disorder that is causing persistent distress should be managed by, or with advice from, a clinician experienced in managing mood disorders.

Treatment of Depression

A People with persistently depressed mood (greater than 6 weeks) after stroke should be offered treatment with antidepressant medication.

C Cognitive behavioural psychotherapy should not be routinely offered to people with persistent low mood after stroke.

Prophylactic Antidepressants

I There is insufficient evidence to recommend administration of prophylactic antidepressant medication after a stroke.

Treatment of Emotionalism

A People with severe, persistent, or troublesome tearfulness (emotionalism) following stroke should be offered antidepressant drug treatment, with the frequency of crying monitored to check effectiveness (Royal College of Physicians, 2002).

Movement Reeducation

I No recommendation for a particular form of movement reeducation can be made (Royal College of Physicians, 2002).

Post-stroke (Central) Pain

A Chronic pain post stroke, especially central pain, may respond to tricyclic antidepressant treatment, which should be tried sooner rather than later (Royal College of Physicians, 2002).

C People with intractable pain following stroke should be referred to a specialist in the assessment and management of pain (Royal College of Physicians, 2002).

Shoulder Pain

A Functional electrical stimulation and transcutaneous electrical nerve stimulation post stroke are not recommended (Price & Pandyan, 2002).

B The use of intra-articular corticosteroid injections for treatment of shoulder pain is not recommended (Snels et al., 2000).

B Shoulder strapping to prevent shoulder pain following stroke is not recommended (Hanger et al., 2000).

Spasticity

B Spasticity in the arm or leg following stroke should not be treated routinely with drugs, either orally or by injection (Royal College of Physicians, 2002).

Information and Education for People with Stroke and Their Caregivers

A All people with stroke and their caregivers should be given information, advice, and the opportunity to talk about the impact of illness upon their lives.

A All stroke services should have educational programmes for people with stroke and their families.

Types of Information

B Educational programmes should be flexible enough to accommodate information needs that differ among individuals and between people with stroke and caregivers, and that change over time.

Information Needs of Caregivers

B The specific needs of the caregivers to be given information, to be communicated with, to be involved in decision making, and to be given support should be considered from the outset.

Delivering Information and Education

A Provision of information alone is insufficient.

B Educational programmes should be based on proven adult learning strategies, with active involvement of the person with stroke and caregivers.

I There is insufficient evidence to specify how educational needs are best met.

Leisure and Social Activities after Stroke

B People with stroke should be offered advice on, and treatment aimed at, achieving their desired level of social activities.

C All people with stroke should be provided with access to public or private transport to facilitate participation in leisure and social activities.

I There is insufficient evidence to make any recommendations about leisure and social needs of people with stroke in residential care settings.

Approaches to Therapy

I There is insufficient evidence to recommend how best to improve the leisure and social needs of people with stroke.

Needs of Caregivers

B Caregivers should be given advice on how to maintain their own leisure and social activities while in a caring role.

Sexuality after a Stroke

B The opportunity to discuss issues relating to sexuality should be offered early after a stroke, to both the person and their partner. This should be initiated by the health professionals.

C Pamphlets and other information on sexuality after stroke should be available to all people with stroke.

C Advice about sexuality should cover both physical aspects (e.g., positioning, sensory deficits, erectile dysfunction, drugs) and psychological aspects (e.g., communication, fears, altered roles, and sense of attractiveness).

Risk of Further Stroke during Sex

C People with stroke and their partners should be counselled on the relatively low absolute risk of sexual activity causing a further stroke.

Driving after a Stroke

C All people who have had a stroke who intend to resume driving should be assessed with regard to their ability to drive safely.

C Evaluation of safe driving skills should include a neurological examination by a specialist physician. If there is doubt about the person's ability to drive safely, assessment by a neuropsychologist or specialist occupational therapist is required. If uncertainty still exists, an on-road test should be undertaken.

GPP The Land Transport Safety Authority (LTSA) guidelines should be adhered to. (See summary on page 59 in the original guideline document.)

GPP Adequate training for healthcare workers, resources, technology, and a centre for driving assessments should be available in all District Health Board areas.

GPP Assessment and subsidies for on-road assessment should be accessible to all people with a stroke in New Zealand.

GPP All people unable to drive after a stroke should be advised on alternative means of transport and the availability of disability taxi vouchers (available through the Stroke Foundation).

I There is insufficient evidence on which to recommend strategies which might improve driving performance after a stroke.

Alternative Therapies for Stroke

A Acupuncture is not recommended in addition to standard rehabilitation care in the management of stroke (Sze et al., 2002).

GPP Clinicians should be familiar with the various alternative therapies offered for stroke and be able to comment on the appropriateness of the approach in the context of the nature of the stroke and any comorbidities.

GPP Health professionals should be aware that it is common for Maori and Pacific peoples to use massage, by a family member or traditional healer, as a way of "healing" people with stroke.

I There is insufficient evidence to make any recommendation on the following therapies: conductive education, homoeopathy, herbal medicines, naturopathy, traditional Chinese medicines, music therapy, aromatherapy, snake-venom or remedy for stroke, spider-venom remedy for stroke, hyperbaric oxygen therapy, chelation therapy, magnetic field therapy, reflexology, osteopathy, sound therapy, light therapy.

Definitions:

Rating Scheme for the Strength of the Recommendations

A

The recommendation is supported by good evidence.

B

The recommendation is supported by fair evidence.

C

The recommendation is supported by expert opinion only and/or limited evidence.

I

No recommendation can be made because the evidence is insufficient. Evidence is lacking, of poor quality or conflicting and the balance of benefits and harms cannot be determined.

Good Practice Point (GPP)

Recommended good practice based on the clinical experience of the guideline development group and where guidance is needed.

CLINICAL ALGORITHM(S)

The original guideline document provides a clinical algorithm for management of stroke.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

This guideline is an adaptation of the American Heart Association (AHA)(Stroke Council), the American Stroke Association (ASA), the Royal College of Physicians (RCP), and the Scottish Intercollegiate Guidelines Network (SIGN) stroke guidelines, with the evidence updated and expanded where thought appropriate.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Organised Stroke Services

- Grade A evidence from meta-analysis of 23 randomised controlled trials by Cochrane Collaboration Stroke Unit
- Trialists shows that organised stroke services save lives, reduce morbidity, reduce length of stay in hospital, and improve long-term quality of life and physical outcomes.
- The evidence suggests that for every 20 patients managed in a stroke unit, rather than a general medical ward, one person less is discharged to institutional care. This translates to annual savings of over $250,000 per 100,000 catchment population. Much of this saving comes from avoidance of the need for institutional care for some people after a stroke.

POTENTIAL HARMS

Not stated

CONTRAINDICATIONS

CONTRAINDICATIONS

For patients with contraindications to anticoagulation, aspirin is recommended although it is much less effective than warfarin in secondary prevention for patients with atrial fibrillation.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

None stated

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

- Publication of the guideline on the Stroke Foundation of New Zealand and New Zealand Guidelines Group Web sites
- Guideline "launch" seminars across the country, highlighting the main messages in the guideline, explaining its use
- Dissemination of electronic versions of the guideline to all District Health Boards to be available on their intranet systems
- Dissemination of electronic and hard-copy versions of the guideline to academic centres for medicine, nursing, physiotherapy, speech and language therapy, occupational therapy, and corresponding colleges and societies
- Dissemination of hard copies of the guideline to services and clinicians in contact with people with a stroke
- Dissemination of relevant sections of the guideline to specialist groups (e.g., general practitioners, residential care institutions, and private hospitals)
- Review and update of preexisting information for people with a stroke and their families/whanau
- Publicity through articles in medical, nursing and therapy journals, lay media, radio interviews, and at a public launch with media coverage
- Audit and feedback to health providers

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

New Zealand Guidelines Group (NZGG). Life after stroke. New Zealand guideline for management of stroke. Wellington (NZ): New Zealand Guidelines Group (NZGG); 2003 Nov. 84 p. [164 references]

ADAPTATION

This guideline is an adaptation of the American Heart Association (AHA)(Stroke Council), the American Stroke Association (ASA), the Royal College of Physicians (RCP) and the Scottish Intercollegiate Guidelines Network (SIGN) stroke guidelines.

American Heart Association

- Broderick JP, Adams HP, Barsan W, et al. Guidelines for the management of spontaneous intracerebral hemorrhage. A statement for health professionals from a special writing group of the Stroke Council, American Heart Association. Stroke 1999; 30: 905-15.
- Albers GW, Hart RG, Lutsep HL, et al. Supplement to the guidelines for the management of transient ischemic attacks. A statement from the ad hoc committee on guidelines for the management of transient ischemic attacks, Stroke Council, American Heart association. Stroke 1999; 30: 2502-11.
- Wolf PA, Clagett P, Easton JD, et al. Preventing ischemic stroke in patients with prior stroke and transient ischemic attack. A statement for healthcare professionals from the Stroke Council of the American Heart Association. Stroke 1999; 30: 1991-4.

American Stroke Association

Adams HP Jr, Adams RJ, Brott T, et al. Guidelines for the early management of patients with ischemic stroke: a scientific statement from the Stroke Council of the American Stroke Association. Stroke 2003; 34: 1056-83.

Royal College of Physicians

Royal College of Physicians: The Intercollegiate Working Party for Stroke. National clinical guidelines for stroke. London: Royal College of Physicians 2000 and update 2002.

Scottish Intercollegiate Guidelines Network

Scottish Intercollegiate Guidelines Network (SIGN). Management of patients with stroke: rehabilitation, prevention and management of complications, and discharge planning. Edinburgh: SIGN 2002 (SIGN publication No. 64).

DATE RELEASED

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GUIDELINE DEVELOPER(S)

New Zealand Guidelines Group - Private Nonprofit Organization
Stroke Foundation of New Zealand, Inc. - Medical Specialty Society

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Ministry of Health

GUIDELINE COMMITTEE

Stroke Guideline Development Team

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

No members of the guideline development team reported any competing interests.

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Australasian College for Emergency Medicine - Medical Specialty Society
Cardiac Society of Australia and New Zealand
Diabetes New Zealand - Disease Specific Society
Ministry of Health, New Zealand - National Government Agency [Non-U.S.]
National Heart Foundation of New Zealand - Disease Specific Society
Neurological Foundation of New Zealand - Disease Specific Society
New Zealand Speech-Language Therapy Association - Disease Specific Society
Royal Australasian College of Physicians - Professional Association
Stroke Society of Australasia - Disease Specific Society

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the New Zealand Guidelines Group Web site.

Print copies: Available from the New Zealand Guidelines Group Inc., Level 30, Grand Plimmer Towers, 2-6 Gilmer Terrace, PO Box 10-665, Wellington, New Zealand; Tel: 64 4 471 4188; Fax: 64 4 471 4185; e-mail: info@nzgg.org.nz.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- New Zealand Guidelines Group (NZGG). General summary. Life after stroke. New Zealand guideline for management of stroke. Wellington (NZ): New Zealand Guidelines Group (NZGG); 2003 Nov. 4 p. Available from in Portable Document Format (PDF) from the New Zealand Guidelines Group Web site.

Print copies: Available from the New Zealand Guidelines Group Inc., Level 30, Grand Plimmer Towers, 2-6 Gilmer Terrace, PO Box 10-665, Wellington, New Zealand; Tel: 64 4 471 4188; Fax: 64 4 471 4185; e-mail: info@nzgg.org.nz.

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on June 23, 2004. The information was verified by the guideline developer on July 19, 2004.

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